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# TRANSLATIONS ON JAPAN
(FOUO 1/79)

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JPRS L/8206

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# TRANSLATIONS ON JAPAN

(FOUO 1/79)

## CONTENTS

POLITICAL AND SOCIOLOGICAL

# FUKUDA FACTION NEEDS NEW CANDIDATE FOR PREMIERSHIP

Tokyo MAINICHI DAILY NEWS in English 14 Dec 78 p 4

[Nagatacho Doings Column by Takehoko Takahashi: "Maneuvering To Build Up New Boss"]

[Text] The greatest goal of a Liberal-Democratic Party faction is to have its boss take over the reins of administration. If the boss loses the will to contend for the premiership, he will be driven out from the position of boss.

One example of this is Shigesaburo Maeo (former speaker of the House of Representatives) who took over the Ikeda faction. Maeo was driven out from the position of boss by a group centering on Masayoshi Ohira (now the prime minister). Ohira became the boss and has eventually succeeded in attaining the faction's goal. This is the reason why Maeo does not feel kindly toward Ohira even now.

Another problem for a faction arises after its boss relinquishes the reins of administration. After Nobusuke Kishi ceased to be the prime minister, the Kishi faction broke up and became divided into the Fukuda, Fujiyama and Shiina factions. At present the wreckage of the Kishi faction remains in the Fukuda faction.

In this respect, the Miki faction is a little different. Possibly because the members are comparatively few, even after Miki's withdrawal from the premiership, Takeo Miki remains "in good condition" and his leadership as boss of a faction does not seem to have deteriorated. One reason for this is his knack in managing a faction which has been gained from a long political career.

At the same time, how long Miki will be able to maintain his influence as boss is problematical. In the presidential election this time, the Miki faction entered Toshio Komoto (now chairman of the LDP policy affairs research council) as candidate.

Formerly minister of international trade and industry, Komoto has now assumed the chairmanship of the policy affairs research council, one of the three key executive posts of the LDP. During the campaigning in the party presidential election, Komoto's name became widely known among the general public. Komoto also has considerably personal financial assets. Under these circumstances, the possibility exists of the Miki faction becoming sooner or later the Komoto faction in reality.

The biggest problem is faced by the Fukuda faction. After being defeated by Ohira in the primary, Fukuda announced on that very day that he would not be a candidate in the main election. This was tantamount to a withdrawal of the Fukuda administration. Fukuda's attitude itself was evaluated highly by the people in general.

## Resistance

The Fukuda faction, however, raised resistance against Ohira over the problem of the party's top officers. This involved the post of LDP secretary general. As a result, the designation of the prime minister was delayed one day. Ultimately Fukuda brought his faction into line, leading to the birth of the Ohira administration.

The eruption within the Fukuda faction over the problem of secretary general was, in effect, a show of opposition toward the faction's elders. The common thought among the younger members of the faction is that Fukuda lost in the primary because the elders remained complacent and did not take sufficient action. The feeling against the elders,

whose responsibility was questioned, took the form of opposition to the initial choice of secretary general.

Upon looking at the persons from the Fukuda faction who have been taken into the Ohira administration, it can be seen that only the elders have assumed posts. Tadao Kuraishi, 78, who has become one of the top LDP officers as chairman of the executive council, was the Fukuda faction's representative in the recent presidential party election.

Foreign Minister Sunao Sonoda, the only minister carried over from the Fukuda Cabinet, was abroad during the election and this is considered to have been one reason why Fukuda lost to Ohira in Kumamoto Prefecture (Sonoda's constituency).

It is reported that heated arguments about this were exchanged between Sonoda and Shintaro Abe (former chief cabinet secretary).

Among those who have entered the cabinet this time, Posts and Telecommunications Minister Nikichi Shirahama and State Minister Shiro Nakano (director general of the National Land Agency), both in their 70s, are, as far as the Fukuda faction is concerned, akin to the "clearing away of a stockpile."

When the Fukuda faction tangled over the problem of the secretary general, it was Shintaro Abe who represented the faction. Although Abe was mentioned as a candidate for the chairmanship of the policy affairs research council, he neither became one of the party's top officials nor entered the cabinet. This is probably because he has become an individual indispensable for strengthening the solidarity of the Fukuda faction from now on.

After relinquishing the premiership, Fukuda is undoubtedly worried about how his faction can be solidified. This is because a faction without a candidate for premiership is likely to see an ebbing of its strength. This can be seen in the path taken up to now by so-called "in-between factions."

Fukuda must therefore be thinking of trying, before his influence wanes, to build up Abe as the faction's boss as rapidly as possible and to boost him as a future candidate for the premiership.

It was for that reason that a shelving of elders took place in the selection of the present selection of cabinet personnel. At least, that is one way of looking at it.



CSO: 4120

POLITICAL AND SOCIOLOGICAL

'SHUKAN SHINCHO' CHIDES ECONOMISTS FOR THEIR PASSIVE ROLE

Tokyo SHUKAN SHINCHO in Japanese 26 Nov 78 pp 36-40

[Article: "Abilities of Our 'Economists' Displaced by Galbraith Whirlwind"]

[Text] A Galbraith whirlwind, indeed. This time, he has come to Japan with the catchphrase, "To surmount the era of uncertainty." As if in hot pursuit, Herman Kahn also arrived with the slogan, "Japan nevertheless will grow." If the former can be compared to a somewhat concerned knight of the roundtable, the latter is a genial, hyperbolical Arabian sorcerer. What are our capable, influential economists doing amid this oracular boom from abroad? On second thought, do such scholars exist?

Prof Sadaichi Chikaraishi of Hosei University, who considers himself a minority, influential economist of Japan, commented, "Whenever I visit outlying regions to give lectures, posters appear, reading, 'Chikaraishi is coming.' It resembles the commotion over Galbraith and Herman Kahn. Japanese are country folks in that respect. In short, it is tantamount to Japanese lacking a 'Celestial concept' and having a high regard for imports. And their academic theories and contentions do not necessarily influence Japan's economic policy."

But is it so? No one believes that contentions of Messrs Galbraith and Kahn will have a direct impact on Japan's economic policy. Likewise, the academic theories of Japan's economists, including Mr Chikaraishi, have failed to move Japan. But it is a fact that the academic theories of Messrs Galbraith and Kahn have had a considerable impact on scholars considered to be the brains of the ruling Liberal-Democratic Party. Thus, we lament and at the same time are astonished at the might of the concept introduced from abroad.

Two scholars have wielded a considerable influence over the LDP since the days of the Ikeda Cabinet. One is Osamu Shimomura, now a critic on economic affairs, and the other is Hisao Kanamori, chief director of the Japan Economic Research Center.

Both were economists who espoused the Ikeda Cabinet's "income doubling theory" and growth above everything else, as if they were pro-inflationists. Today, however, diverse theoretical views separate these two former growth proponents.

Mr Shimomura has become a rather pessimistic, low growth advocate and is currently actively promoting the controversial "general consumption tax." Mr Kanamori, on the other hand, leans toward a "rose-colored growth theory," optimistically advocating lower taxes, issuance of additional red ink national bonds and greater public investments.

The split between these two men attests to the arrival of an "era of uncertainty" as described by Mr Galbraith. Obviously, Mr Kanamori has been possessed by Mr Herman Kahn.

Mr Kahn is a recent visitor to Japan, uttering magical words to the effect that "Japan nevertheless will grow."

Previously, he pleased the late Prime Minister Sato with his remarks that "the 21st century will be Japan's," and now he again demonstrates the magic of pleasant remarks.

Although Prime Minister Fukuda was assailed in the Diet for "promising to the world an economic growth of 7 percent, considered unachievable," Mr Kahn, stroking his beard, calmly stated that "Japan can achieve about a 12 percent growth, rather than 7 percent." A cautious probe of the substance of such a fervent oracle proved to be even more astonishing.

Briefly, a new, small city will be developed throughout the Japanese archipelago, characterized by a consumption culture like those of major cities. In other words, through an unlimited internal development, Japan will certainly undergo growth, he explains.

Mr Kanamori concurs with Mr Kahn's growth theory. At a council meeting held on 10 October in the presence of Mr Galbraith, he expounded on a growth theory similar to Kahn's.

Needless to say, he was instantly rebutted by Mr Galbraith:

"I wish to say to Mr Kanamori that growth alone is futile. Pursuit of growth only would precipitate an anti-growth move. Consideration should be given to the issue of zero growth previously advocated by the Rome Club. (Note: An international organ on issues of humanity established in 1968 by Orerio Bettchui, an Italian businessman. Japanese scholars are participants. In 1972, it issued an appeal on the noted "limits of growth")

"Stress on growth does not mean we can afford to lose the beauty of rural life...the limits of growth must be considered."

Government Service Scholars Attending Council Meetings

It must be said in defense of Mr Galbraith that he definitely is not a proponent of zero growth. According to him, today's economy differs from the previous era. For example, supply and demand in the market is not necessarily created by price competition. And there is no assurance it would be. Consequently, recession does not read like a school textbook, and growth, obviously, must be achieved to surmount it. But a tempo such as observed in the past cannot be anticipated. It is the thinking along these lines that overlaps that of Mr Osamu Shimomura's. Although Mr Chikaraishi stated previously that "Galbraith and Kahn represented the international version of Shimomura and Kanamori,""in our eyes, Shimomura and Kanamori are the Japanese version of Galbraith and Kahn. Both Messrs Shimomura and Kanamori merely vividly reflect the pessimism and optimism of Japan's political and financial circles in the Galbraith and Kahn style of thinking, and it is virtually inconceivable for either to have a decisive role in Japan's economic policy. Why is this? A certain government economist explained:

"In Japan, a very strong bureaucratic structure exists, with a collection of fairly outstanding human resources. And because of Japan's unique slivered society wherein no personnel interchange exists among academic, bureaucratic, political and economic quarters, there actually is no room for scholars in the economic policy formulating bureaucratic quarter. Even when contacted for their views, Japan's scholars do not possess any information or data. In such a situation, it is inconceivable in Japan for scholars to play a role in policy formulation. Ultimately, government officials are the ones who assume such a role."

Incidentally, both Shimomura and Kanamori are former government officials and are not true scholars. For this reason, they do wield some influence over political and bureaucratic quarters, but do not play any major role. But what are other true scholars doing?

Scholars of some fame do take part in government council meetings as members and are in a position to influence Japan's economic policy. But a revelation of true conditions makes one despair. Said the same government economist: "Prominent scholars may participate in government council meetings, but they are virtually ignorant of the practical side of economics. No matter how wise, they cannot have their say in economic policy unless they are familiar with the practical aspects. Their purpose in attending council meetings is to obtain information and data belonging to government agencies. They use such information and data in their own researches, lectures and writings.

"Normally, data are gathered and submitted to council meetings by government officials who also prepare the draft, include the opinions of scholars, and make some changes. In reality, that is just a formality, for the absence of scholars has no impact on Japan's economic policy."

How disgraceful. Rather than being in a position to influence economic policy, the scholars themselves have difficulty in keeping up with the times. They represent the ordinary government service scholars. According to Prof Chiaki Nishiyama of Rikkyo University, one-half of such scholars are Marxist economists.

"Marxist economists have deviated from realities and long criticized the structure, while scholars of modern economy have taken shelter in the world of pure theory to avoid criticisms by remaining silent on realities."

Since both are extremely remote from realities, they are unable to speak out on the living economy which confronts them. Their creativity, also, does not function.

"Indebted to the United States for Growth"

The Marxist economists enjoy the support of the press and magazines in general.

A person remarked that "two-thirds of economic editorials in newspapers are by Marxist economists." While the accuracy of such a statement is unknown, it is probably true that Marxist economists in opposition to authority and structure are engaged in writing difficult, abstract theories to please a small segment of citizen power, new leftists, opposition parties and labor unions.

The subject of Marxist economists brings to our mind the case of Tokyo Governor Minobe, Kanagawa Prefectural Governor Nagasu and Osaka Governor Kuroda, all of whom were against the structure. However, they all suffered setbacks in the actual economy called local government. To them, economy represents a hatred of major enterprises and widespread allocation of the welfare budget. We do not mean that major enterprises are invariably right and that welfare is wrong. Says Mr Galbraith:

"The development of capitalistic industry (condensed) is not what Marx envisioned. Enterprises deprived capitalists of power and gave it to its own organization or bureaucracy--which I call technostructure (Note: A decision-making organization of technicians' groups with knowledge, ability and experience). Partly for that reason, confrontation with labor was not so serious as Marx had thought. Also, labor unions did not become so revolutionary. And labor unions and the welfare state shed the roughness of capitalism beyond Marx's imagination." ("Introduction to Modern Economy," published by TBS Britannica)

Now, capitalism itself is paving the way for some type of socialism for preservation of freedom and social order, eliminating the need for any thinking within the anti-structural concept.

Nevertheless, it is indeed surprising that Japan's economists have so far failed to contribute to the state and to the people for preservation of freedom and social order.

For example, in the United States, there are Nobel prize winners such as Friedman and Samuelson who influenced that country's economic policy, while in the West German government, there exists a "Five Wise Men's Committee" composed of five outstanding economists.

Last year, the United States proposed, in view of global economic recession and imbalances, that Japan, the United States and Germany assume the role of a locomotive. But the West German government, at the insistence of its "Five Wise Men's Committee" and five private economic research institutes in Berlin, Munich, Kiel, Hamburg and Bonn opposed the proposal, preferring instead to focus on its own nation's price stabilization and anti-inflationary measures. The power exercised by scholars is unimaginable in Japan.

But how did Japan, without any outstanding scholars with leadership, achieve a postwar economic growth which amazed the world?

"We owe that to efforts of each individual, Japan's bureaucratic structure fostered since the Meiji period, and capable government officials," said a veteran member of the Ministry of Finance, proudly. The statement stemmed from a sense of self-conceit. Opposing views were made by a former diplomat:

"While it is true that there are no capable scholars, it probably is a lie that we are indebted to government agencies and outstanding government officials for Japan's postwar growth.

"Precisely speaking, it is due to U.S. aid. It lent us funds, taught us technology and offered us vast markets. It was an allout service. Government officials merely made available such services to the public. Subsequently, they yielded to the pressures of politicians, labor unions, agricultural organizations and medical associations and, while with a straight face, they continued their illogical, contradictory economic policy until today.

"Fortunately, through the efforts of private enterprises, the nation prospered and along with it the policy, while containing contradictions, was implemented. As a result, wages were boosted and welfare assumed the shape of that of a major country. But now, the inefficiency of those government officials who bowed to pressures of politicians and lobbying organizations has begun to show up as a major blunder. The pressures of agriculture, especially on the rice issue, the National Railway deficit, and finance... the stupidity of constructing three connecting bridges between Honshu and Shikoku at a time of financial deficit can be attributed to government officials bending under pressure. Who is going to assume responsibility for it now?"

An Enterprise Can Be Compared to a Nation

Said a certain bank executive:

"That the government officials are the motive force behind Japan's growth is a joke. It is a fact that America furnished aid, but in the final analysis, it was the enterprises. With many employees on the payroll, enterprises must somehow carry on. Mr Galbraith points this out. But many Japanese industries deprived capitalists of power shortly after the war and established a technostructure. In other words, they gathered human resources, decided on the direction of business prudently but boldly, and established a cooperative setup with labor unions. Without relying on the state, enterprises themselves became involved in helping the weak and administering public welfare. Through their own survey and research organs, they were able to study the domestic as well as world economic trend. In short, an enterprise can be compared to a state, with its own 'scholars' for policy formulation.

"Thus, there is no need to listen to what Japan's economic scholars have to say; time would be better spent in hearing the academic theories of Messrs Galbraith and Kahn. Also, government officials have been appointed to other positions by favoritism as required. The power of enterprises is the motive force behind the growth."

It is true that Japan's enterprises, without lending an ear to "lectures" of Japan's scholars, are looking for a way, through technostructure, to sustain the growth or status quo. Even small and medium size ceramic dealers in the export field having suffered a heavy blow from the high yen do not go into bankruptcy so easily. This is because a small number of technostructures had collected their wits to overcome the crisis by coming forth with a program of rationalization and development of a new domestic market. Said Mr Akio Watanabe, owner of Maruhachi Watanabe Pottery Works of Tajimi, Gifu Prefecture, emphatically:

"Rather than listen to irresponsible scholars, I prefer to hear and learn from Mr Konosuke Matsushita of Matsushita and Mr Eiji Toyota of Toyota. They do not make mistakes. With several tens of thousands of employees, their responsibilities are heavier in certain respects than those of the prime minister. The task remaining is to scrutinize independently and effectively the trend of the world economy as its affects Japan."

In short, Japan's scholars are virtually isolated. Will this do?

In view of such a situation, it is hoped that, rather than as researchers, they serve as capable instructors of students. This could be more important.



9097
CSO: 4105

POLITICAL AND SOCIOLOGICAL

OHIRA THE LAST OF 'YOSHIDA FAMILY OFFSPRING' IN LDP

Tokyo MAINICHI DAILY NEWS in English 9 Dec 78 p 1

[Article by "Political Commentator:" "Ohira Facing Hard Times in Future?"]

[Text]

There is no fortune-teller who could predict very accurately the future course of a just-born cabinet. But the way in which the newly-inaugurated Ohira cabinet was created is seemingly an ominous sign that this regime may not face a smooth and stable future course.

The phenomenon also indicates that the Ohira regime, an inheritor of the LDP's mainstream which originated in the late Prime Minister Shigeru Yoshida's government, is on the threshold of a new age of "conservative-progressive" coalition. This cabinet may be in a transitory period of change shifting from a single-handed rule of the LDP to such a coalition, it is observed.

## Alienation

An observation of this kind is based on the analysis that the group centering on Ohira and his faction may become alienated from the "traditional conservatives" in the LDP and may have to seek a coalition partner among moderate opposition parties, including the New Liberal Club. This analysis also reflects the fact that the LDP may lose a majority at any moment.

If the LDP were still enjoying a comfortable majority, as in the past, Ohira might have been more proud of being in the mainstream of the LDP and might have been taking advantage of it in managing the party. He could have pulled his LDP followers, particularly hawkish conservatists, or neglected their pressure in carrying out his policy.

Actually, Ohira is the last "offspring" of the Yoshida family in the LDP, in which were such ex-prime ministers as Hayato Ikeda, Eisaku Sato and Kakuei Tanaka.

Ohira was picked by the late Prime Minister Ikeda, an "immediate successor" of the Yoshida family, when he was a Finance Ministry official and, since then, he has become associated with the Yoshida family group. He was chief cabinet secretary in the Ikeda cabinet.

This group is, in general, rather bureaucratic and less nationalistic when compared to the so-called "traditional conservatist" group which is more conservative and more.

nationalistic.

A typical example is seen in the choice of defense policy. Since the age of the Yoshida regime, the LDP government has been taking a stance to depend on the United States and the security treaty with it for the nation's defense while concentrating its whole energy on the build-up of economic power.

Therefore, no single mainstream leader has ever advocated the revision of the war-renouncing Japanese Constitution and the positive large-scale armament of Japan.

This "lukewarm" policy has been the root of discrepancy within the LDP in its policy-making although it did surface rarely while it had a strong leadership on the basis of a comfortable majority in the National Diet.

## Uneasiness

The nationalist (or traditional) conservatists, however, have come to feel the "danger" of losing the majority and of having the nation come under the influence of progressive opposition parties. This sense of uneasiness is in the background of the moves made by hawkish LDP members to check Ohira's designation as prime minister in the Diet.

Under these circumstances Ohira's alternative is either to yield to such a pressure and to shift his policy to a more conservative and nationalistic one, or to make an approach to moderate opposition parties — New Liberal Club, Komeito or Democratic Socialist Party — in forming a coalition after separating from the extreme rightists in the LDP.

Being secretary general for the past two years under the Fukuda cabinet, Ohira has sufficient experience to go along with them through patient consultations, instead of confrontations, which he learned from experience in steering the Diet.

Actually, there are Ohira supporters among independent ex-LDP Diet members and NLC members.

Ohira might have to make a critical decision if and when he comes to a crucial moment of choice, particularly in connection with the defense policy. But it still seems to be too early to predict when and how the moment will come.



CSO: 4120

ECONOMIC

JAPANESE GOVERNMENT STEPS UP AID TO AFRICA

Tokyo NIHON KEIZAI SHINBUN in Japanese 6 Oct 78 p 2

[Text] As an integral part of its omnidirectional foreign economic policy, the government has decided to step up aid to Africa, to which this country had not until recently made a good showing. The government is therefore dispatching "an economic cooperation inspection team," composed of foreign aid specialists primarily from the Foreign Ministry and International Cooperation Agency, to eight African countries including Niger and Burundi starting late this month. The inspection team will spend approximately 2 weeks investigating underground water development, and construction plans for hospitals and schools, and will discuss how economic grants and technological cooperation can be arranged with the perspective governments. By putting this plan into practice, the goal is to double ODA (Official Development Assistance) in 3 years, and increase recipients of Japanese aid--which had tended to concentrate in Asia--in Africa. It is said that this is the first time the government has sent an inspection team to any country before requests were made by would-be aid recipients.

By extending aid to Africa, where many countries are late developing nations with less than $100 in gross domestic production per person, the Foreign Ministry hopes that Japan's diplomatic ties with African nations, whose voices are increasingly heard on the international scene including in the UN, can be strengthened.

Last July, prior to the summit talks of advanced nations held in Bonn, the government announced its plan of "doubling the ODA appropriation in 3 years on a dollar basis based on the 1977 record." The record for last year shows that as much as 60 percent of the ODA went to Asia. In light of that record and of Japan's omnidirectional foreign policy which is to maintain friendly relations with all countries, Japan has decided it is necessary to gradually aid recipients in other parts of the world as well. With reference to Africa in particular, in light of its growing political influence in international affairs, Foreign Minister Sonoda has shown his interest and has gone so far as to express his intention of "visiting Africa within this year if possible."

The inspection team is made up of three groups: The first group, scheduled to leave October 20, will visit four countries, Niger, Upper Volta, Burundi

and Rwanda; the second, scheduled to leave late next month, will visit four countries of the Central African Republic, Benin, Tongo and Guinea. Though the applications for sending the inspection teams to these eight countries yet to be officially sent as early as this week, the Foreign Ministry feels confident that permission will be granted through mere prior consultation. A plan has also been made to send a third inspection team next January, with the details, such as recipient countries to be worked out in the near future.

Due in part to the fact that this country's aid had been concentrated in Asian countries close by, sending an inspection team to a would-be recipient country was done only after requests had been received from that country. What is unique in this case is the fact that the positive step of sending a team before a request had been received from would-be recipients, has been taken. Very little is clearly known about Africa--where there are a number of newly created countries--as concerns domestic situations and the types of aid needed. The Foreign Ministry explains that, by dispatching an inspection team composed of specialists and by fully investigating the economic conditions in recipient countries, effective use of Japan's aid can be expected. In addition, the Ministry intends to dramatically increase next-years budget appropriation for development and research in the less-developed nations; consequently, it is believed the number of such inspection teams will increase in the future.

Japan's track record for providing aid to Africa is poor. In FY 1977 it amounted to only $56.25 million or 6.3 percent of ODA. Except for a few instances, very little aid had been given to the late developing nations of Africa and the MSCA, the developing countries most severely affected by the oil crisis.

Figure

(1) Countries to which Japan is dispatching inspection teams
(2) Upper Volta
(3) Guinea
(4) Togo
(5) Niger
(6) Benin
(7) Central African Republic
(8) Rwanda
(9) Burundi





9371
CSO: 4105

SCIENCE AND TECHNOLOGY

## WHITE PAPER ON SCIENCE PLACES MORE WEIGHT ON GOVERNMENT ROLE

Tokyo NIKKAN KOGYO SHINBUN in Japanese 28 Oct 78 p 3

[Text] Director Kumagai of the Science and Technology Agency disclosed the science and technology white paper for JFY 1977 at the cabinet meeting on the 27th and received cabinet approval. This white paper, which could also be titled "The government's increasing importance in research activities," places emphasis on the increasing role of the government in research activities to resolve the energy problem, and greatly advance the living standards of its people while paving the way for a period of low economic growth. It disengages itself from the civilian leadership type activity of the past and will involve the government in increased research and development funding to emphasize promotion of basic scientific research. At the same time, it will assure the nation of researchers of superior caliber and place emphasis on promoting planned and efficient research and development.

This white paper is the 16th of its kind, and it is comprised of three sections. The first section is concerned primarily with the importance of the government's research activities, while the second and third sections introduce respectively the Science and Technology Agency's activities centered on JFY 1977 and the government's policies.

The first section serves as an introduction to describe the government's role in research activities and introduces some specific examples of fruitful research results in various areas such as vaccines, pendulum electric vehicles, numerical controlled tool machinery, and electric automobiles. Next the governments' roles in research activities in the leading countries of the western world are compared with that of Japan, and the features of the Japanese setup are enumerated. According to this account, the fraction of the total research funds taken up by government organs including local public corporations is about 30 percent. In contrast, this figure is 50 percent in the United States and France and 40 percent in West Germany and the United Kingdom. In this manner, the governments' roles in research are much greater in most of these western countries compared to Japan.

At the same time, this section reveals that the fraction of the research funds allocated to basic research, including applied research, is more than

the large level of 50 percent of the governmental funds for different types of research. The main recipients of these funds are universities, great emphasis is placed on nuclear power and space developments, the fraction allotted to national defense research is very small compared to the leading countries of the western world, and the funds assigned to cooperative research efforts with developing countries are not always very high. These are some of the features that are listed. In addition, there is the aspect that nearly all of the government's funds are channeled to universities, governmental research organs, and special corporations, while funds transfers to the industrial world are very small. Technological transfer of the results of basic and applied research on the part of universities to private areas and "academic-private" cooperation are areas that are particularly deficient. Among these, there is some question as to the effectiveness of subsidies where no specific results are requested.

In view of this situation, this white paper treats the following as emergency measures: 1) response to the energy problem, 2) improvement of the quality of the people's living, 3) promotion of independent development of industrial technology, and 4) promotion of research cooperation with developing countries. This paper also states that the government should target at least 2.5 percent of the gross national product to be assigned to research and development in line with the results shown by the Science and Technology Agency survey and plan further increase to 3 percent for the long term. This is necessary to reinforce and expand research and development.

The following is the gist of the Science and Technology Agency white paper.

(Section 1. The Increasing Importance in the Government's Research Activities)

Chapter 1: The Government's Role in Research Activities

The advance in science and technology can be cited as having supported this country's social and economic development during the postwar years. Within this framework the government has taken varied steps in many different areas to lend direction to research and development, providing and expanding educational facilities to train researchers and technologists, and to provide a preferential taxing system in a manner quite apart from private efforts. Among the developments that have served to raise the quality of living are the encephalitis vaccine, improved super short wave all directional radio beacon that is presently installed on the airways, the construction of the Shinkansen (bullet express train), the development of the pendulum electric car capable of increased speeds around curves present on existing tracks and reduction in passenger unpleasantness resulting from excessive centrifugal force, and the development of the pulse signal modulation mode (PCN-24 mode) by the Nippon Telegraph and Telephone Public Corporation. These are all the results of the government's activities in research and development.

In another direction, industrial developmental items include numerically controlled tool machinery, carbon fibers, electric automobiles, and sea

water desalination and byproduct utilization, which are research and development efforts requiring great length of time and large fiscal outlays. There are also analytical, material, and electronic technology, which involve research and development in leading and basic areas. Furthermore, the government is playing a leading role in the large industrial technological developments of a leading nature that are considered urgently necessary for improving the national economy. At the same time, the government is also promoting research and development in nuclear power, space exploration, ocean exploration, and the life sciences which all have some specific applications in the future. The advantage of governmental activity in research is the ability to regiment governmental organs with their high capabilities in the basic areas with the private organs who have high industrialization capabilities and resolve very difficult problems.

Chapter 2. Features of the Government's Research Activities Trends in Government Research Funding According to Objectives The government of each country plays a considerable role in research funds, which are the prime moving force behind research activities. The Japanese Government is no exception, and the research funds advanced by the government have increased tremendously during recent years. On the other hand, the fraction in research funds of the total research funds expended in this country accounted for by government funds, including those for local public groups, is but 30 percent, and there are many countries of the western world whose governments' contributions are substantially greater than those of the Japanese Government. When the research trends according to objectives for the different countries are compared and analyzed, it can be seen that the United States places emphasis on research in practical areas as represented by the development of the space shuttle along with research in response to social needs such as that in the carcinogenic field as well as in the energy and environmental areas. The United Kingdom supports the fostering of a private aircraft production industry, while West Germany promotes the steel industry, which also takes in private aircraft development.

In this respect Japan 1) puts out the same ratio of research funds for basic research in the scientific area with respect to the total research funds, which is of the same level as that of West Germany, 2) lets out all possible funds for nuclear power development, 3) will sharply increase its funds allocated to space development at the turn of the 1970 decade, 4) puts in very little toward defense research compared to the leading countries of the western world, and 5) provides a subsidy fund for promoting large-scale research such as that given to the electronic computer industry.

Nature of Research Funds and Status of the Research Implementing Organization Japan and the United States follow the same trend in that the government appropriates more than half of the total funds for basic research. On the other hand, where the government of the United States is responsible for about 50 percent of the funds for applied and developmental research, the Japanese Government puts out but very little, and its load of developmental research is but 10 percent or so. In addition, government research organs

in the United States take the central role in the research implementing organization in the area of applied research, while private industry uses 60 percent of government funds for developmental research. In contrast, applied research in Japan is assigned to universities while the fraction of developmental research funds assigned to private nonprofit research organs is the largest.

On the other hand, in the area of industrial activities where development is a prime objective, the United States allocates 50 percent of government funds (30 percent of the total industrial research funds), the United Kingdom 40 percent (30 percent of the total industrial research funds), France 20 percent (30 percent), and West Germany 20 percent (20 percent) while, in contrast, the Japanese Government puts out essentially no funds for use in the industrial area. The government's research outlay for JFY 1977 provided 40 percent for subsidies, and the main recipients were nuclear power and space development along with special research corporate organs to which about half the subsidies were allocated. Of these subsidies, only 6 percent of the funds directed to the special corporations found its way to private research activities during JFY 1976.

Mode of Promoting Research Activities as Judged From the Distribution Pattern of Government Research Funds The national research organs and related organs account for about 60 percent of ordinary research funds for basic research. At the same time, there is roughly a 1 to 2 ratio between subsidies and consigned funds that make up the government's monetary allocation to private industry, and the major portion of the subsidies goes to promoting the electronic computer industry and development of important technology. Judging from the trends in disbursement of government research subsidies, there is major emphasis placed on promoting basic scientific research, and it may be said that this course activates the market structure in a growing economy and takes in the most basic areas of activating private research in a most effective manner.

Trend in Fraction of Government Budget Taken Up by Research Funds and Planning of Research Activities The fraction of the national budget of the United States taken up by research funds increased from 8 percent in fiscal year 1960 to about 12 percent during the middle of the same decade and then decreased to about 6 percent in 1975. The major factors responsible for these sharp increases and decreases are the changing emphasis placed on research on space, nuclear power, and national defense. This fraction of Japan's budget was increased from the 3.0 percent in 1960 to 3.5 percent, and the main beneficiaries of this increase have been national schools, nuclear power, and space development. Looking now at the status of planned science and technology activities in the different countries, 1) the western countries including Japan are planning the development of important research subjects in the form of projects, 2) research and development plans on energy have been formulated in West Germany, Japan, and the United States, and 3) France has incorporated a plan to activate research throughout the entire country into its economic plan. In Japan the reports of the Science and Technology Council reflect these directions.

Changes in Domestic and Foreign Situations That Influence Research Activities

The technological level of the facilities that industries presently hold in the midst of stagnated funding of facilities in Japan's private industrial area when viewed from an international level is such that the present production facilities are still relatively new compared to production industries in general, and it does not seem conceivable that any worsening in the industrial environment will directly influence recovery in industrial activities in an adverse manner as seen from the production technology that will give rise to funds for new facilities before the present facilities deteriorate and allow lowered costs, increased production, and production of national economic struggle. At the same time, about 40 percent of industry is placing emphasis on promoting technological development, however, they are faced with the present situation of insufficient recovery in the profit picture that the capacity for technological development by industry, particularly along the lines of developments requiring large sums of money and carrying great risk, and how to reinforce technological development capabilities in those areas is presenting a number of problems.

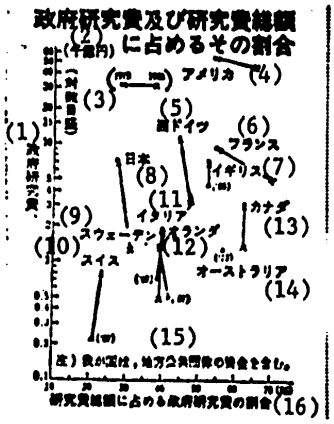
Development of Governmental Research Activities The thing to consider, first of all, is the reaction to the energy problem. It is necessary to consider the assurance of the necessary funds and manpower for promoting nuclear power an d the Sunshine and Moonlight projects. On the other hand, the accumulation of independent technology along the lines of energy technology will not only serve to provide Japan, whose resources are so poor, with stabilized energy resources and enable the amassing of technology in the safety assurance area, which is the principal premise for the utilization of nuclear energy, but will provide a technological base by which Japan can participate in international cooperative efforts on new energy developments and research and developments that require vast capital and much time as well as provide bargaining power to counter proposals from resources rich countries when negotiating for their resources. This is a must approach for a country that plans stable growth.

In another direction along the lines of promotion of industrial technology, balance in technology exchange unlike balance in trade exchange is a one way street with the four leading countries of the western world, such that imports dominate overwhelmingly. And looking further at the fraction of this balance with respect to the research funds used, between 10 and 30 percent of the available research funds is paid out to these four countries just by the transport machinery industry, excluding the general machine tool, electrical equipment and tool, and automobile industries. On the other hand, it will be difficult to continue this active import as in the past in view of the reduction in innovative technology generated in these four countries and the backlash generated in this country to this import. In this manner, there is need to promote more independent technological development on our part.

In this situation, electronic computers have developed to the stage that today it possesses technological capability to seriously challenge IBM in the area of new types of computers as the result of energetic private research activities, planned production and utilization, and assistance in funds provided by governmental policies. It is of note that the domestically produced units now take up 55.1 percent of all the computers in Japan, indicating the growth in the hardware area by the domestic producers. On the other hand, the total research funds, including those allocated to the still inferior software area, for the six large companies of Japan do not come up to even one-fifth of what IBM spends. In this manner, it is a problem just how to combat this situation through private cooperation and clearly define a counter strategy.

There is need to strengthen independent development of industrial technology in this country. What is needed in this situation is the promotion of research and development through very close liaison between production, government, and academic circles under the premise of strengthening the technological development capability of private industry together with increased government subsidies. (Sections 2 and 3 are omitted.)

Government Research Funds and Fraction They Take Up of Total Research Funds




Key:

1. government research funds
2. (billion yen)
3. (log scale)
4. United States
5. West Germany
6. France
7. United Kingdom
8. Japan
9. Sweden
10. Switzerland
11. Italy
12. Holland
13. Canada
14. Australia
15. Note) the Japanese data include funds for local public groups
16. fraction of total research funds accounted for by government research funds



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SCIENCE AND TECHNOLOGY

## TECHNOLOGY TRANSFER CENTER TO BE ESTABLISHED

Tokyo NIKKAN KOGYO SHINBUN in Japanese 31 Oct 78 p 2

[Editorial: "Technology Transfer Center and Research and Development"]

[Text] The Research Development Corporation of Japan will establish the "Technology Transfer Center" starting this Japanese fiscal year. The function of this center will be to survey and analyze the technology that the production world has at hand at the present time as well as to seek out technology that is possessed by other industries or individuals (such as patents and knowhow) in order to transfer or popularize it to requesting parties. Since one role of this center is to collect information of superior technology beforehand, this center will incorporate a technological data bank capability that it is thought will pave the way for a smooth flow of technology. Japan with its meager resources must rely on its research and development strength and its technological capability, and it should regard this technological policy as one that is strictly in a positive direction.

Japan's industrial world has developed through the introduction of overseas technology, but it can be said that there is presently little in the form of new technology that can be found in these overseas sources. This is why there are a number of researchers who lament the fact that innovative technology has hit rock bottom on a world-wide scale. How should Japan handle new technology development in the light of this situation? With but very limited resources coupled with an economic situation that has hit the doldrums, the industrial world is inextricably involved in a state where it must be extremely conservative in doling out research funds.

One countermeasure to this present situation is to popularize technology that has already been developed and effectively utilize the information. In addition, these can be combined to offer entirely new technology. The Research Development Corporation of Japan and the Japan Industrial Technology Promotional Society (external group of the Agency of Industrial Science and Technology) together with other groups have banded together to serve to disseminate the technological fruits of Japan's research organs to date to the industrial world.

In order to reinforce this technology dissemination operation further, the Research Development Corporation of Japan decided to establish this center. This center will also serve as the bridge to transfer and disseminate technology possessed by individual industries to other industries with the intent of raising the technology level of the entire industrial world. In addition, it is planned to export leading technology, and cooperative ties with research and development public corporations in the United Kingdom and France are being strengthened. Unlike the export of goods, the export of technology is seldom encumbered with international problems. Since introduction of new technology promotes technology in the importing country, it is ususally welcomed.

It is needless to say that patents and knowhow represent "goods" whose values differ from the normal line of goods. These are goods but with large distribution pipes, and they are never in excess. In 1970 Hitachi, Limited initiated an all out disclosure of its proprietary industrial rights centered on its patents, and this was followed by participation from a segment of industry, however, the situation at present is one in which technology transfer between industries is not all that was hoped for.

Consequently, it is expected that the establishment of this center will help activate superior interflow of technology. In line with this center's activities, the industrial world must revise its closed type technology transfer of the past and adopt a mood for smooth technology transfer between industries.



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SCIENCE AND TECHNOLOGY

PROBLEMS IN FOREIGN PATENT APPLICATIONS EXAMINED

Tokyo DENPA SHINBUN in Japanese 1 Nov 78 p 1

["Article: Patent Application Rights in Peril"]

[Text] Foreign Enterprises Have Advantage: Various Special Considerations Given for Customs Clearance Outside of Bonded Areas

At a time when the imbalance in Japan-U.S. trade is an issue, many complaints are reportedly brought through the Japanese government agencies concerned against Japanese law firms (applying agents for the enterprises). The complaints point out that, in the case of U.S. companies submitting patent applications to the Japan Patent Agency, inadequate customs procedures cause the effective deadline (in the United States, it is 1 year after the application is submitted) to run out despite claims for priority treatment, with the result that they lose out to Japanese firms in the competition for patent rights. Actually, however, it is customary for Japanese customs authorities to give special consideration to the strong requests from the American shippers and their Japanese customs respresentatives, or applying agents, and to provide customs clearance immediately prior to the shipment of their goods from the airport to the bonded area. The interests concerned therefore interpret such complaints as being one-sided criticisms by U.S. enterprises, which are not fully aware of the actual situation. On the other hand, some industrial circles (in Japan) sharply assail the competition over prior handling of patent applications as resulting from the government's naive administrative policy, and are urging the government to come up with some solution for the future.

Industry Points Out "Naive Administration"

Many of the goods passing through Japanese customs are accompanied by documents of application for patent rights.

In 1975, there were 24,703 cases of patent application by foreigners (15.5 percent of total cases). In 1976, there was a slight increase of 25,254 cases (15.7 percent), and 25,015 cases (15.5 percent) in 1977. Thus the ratio of foreign applications to total cases has been fairly constant. Also, foreign applications concerning new and practical

innovations have totaled less than 1 percent, and are therefore trivial in relation to the total number of applications (according to the General Affairs Division of the Patent Agency).

Thus, when a person in a foreign country seeks to acquire patent rights in Japan, he may apply to the Patent Agency through his agent residing in Japan. Also, it is stipulated in Article 4 of the Paris treaty on the protection of industrial patent rights, that decisions on customs clearance are (1) limited to goods for which the person has submitted an application in his own country (the principal country); (2) provided he completes application procedures in the secondary country within a year after submitting his application in the principal country, and the newness of the patent is determined on the basis of the period retroactive to the date of application in the principal country.

Problem Lies With Drafter

There are some documents of application which are sent without claiming priority treatment, and in such cases the priority treatment period of 1 year does not apply. The right of priority treatment is easily acquired by merely attaching a signed request. However, there are many cases where the applicant receives his papers after completing import procedures, only to find that in reality his right to priority treatment has been lost. In such cases, the drafter of the application is to blame (according to a law firm which acts as applying agent for foreign enterprises).

In other words, although the documents are submitted to the Patent Agency and the Japanese courts under a given deadline, the applicant is unable to acquire the patent right he seeks, because the documents are not processed within the deadline. As a result, the client (foreign manufacturer, et al) files a complaint against his legal agent. However, proper procedures are to send the pertinent documents of application by air parcel post, and these are released to the client's customs representative or applying agent by a telex cable sent by the client. The agent submits them personally to the Patent Agency, to be processed according to the principle of "priority treatment."

Documents Facing Imminent Deadline

The problem lies with documents which are sent in close to the deadline. It is easy to visualize a client who claims priority treatment and orders his customs representative and applying agent in Japan to take emergency measures. There are reportedly many cases where the agent, who has received advance notice, negotiates with the Tokyo customs official stationed at Narita Airport to provide customs clearance at Narita, in order to expedite the processing of the documents which have been sent to the Haraki office in Funabashi City like regular air parcels. The customs officials admit that they have no alternative except to recognize these urgent requests.

However, generally speaking, shipments arriving at the Haraki office are cleared with at most 1 or 2 days' delay. The shipper (receiver and applying agent in Japan) is notified by the carrier airline, and it is a violation of the rules to clear customs at a location other than the bonded area (according to Toshio Kato, assistant section chief, Import Section, Customs Bureau, Finance Ministry).

Violation of Rules

Customs procedures for foreign goods in bonded areas are stipulated by customs laws (Article 21 of the Fixed Customs Rates Law). In the case of Japan, the stipulated area is principally Haraki. Therefore, the emergency measures taken by Tokyo customs officials are clearly inappropriate.

As for the time involved from the submission of an import declaration until the goods clear customs, customs officials explain that a delay of more than 2 days for "on-line" processing with the client's representative is unthinkable. Also, some cases are cleared within several seconds, depending on the contents (according to assistant section chief Kato).

As a rule, goods arriving at Narita Airport are all cleared at Haraki. However, customs officials do admit that there are urgent cases which are cleared at Narita, based on the judgment of the customs officials involved.

Master Handling in the United States

If the goods are shipped through Haraki and the deadline is imminent, it is of no avail to rush to the Patent Agency (according to the aforementioned law firm). The only alternative is to give "top agent treatment" to the goods shipped from a foreign country to Japan. In other words, they are designated as "top urgency goods." Reportedly, the customs officials will then be able to expedite clearance on request by the customs representative or applying agent. In the United States, such procedures are called "master handling." This is one advantage foreign enterprises have in shipping their goods as individual shipments instead of mixed shipments.

In any case, "some clients suddenly appear before us with goods whose marketability in Japan is doubtful, and they cannot blame us if they fail to receive priority treatment despite their claims for such." (Mr Akabane of the Yuasa & Hara law firm of Tokyo).

Even though a client is successful in receiving customs clearance at Haraki, the translation of documents sometimes takes long and does not leave much leeway for his application to be submitted to the Patent Agency. It seems to be the consensus of the law firms that recently an increasing number of complaints have been filed unilaterally, without full understanding of the conditions in Japan. Also, administrative inadequacies have come under increasing criticism from industrial circles, who point out the uneven customs procedures and demand that the government take a stricter position

regarding the problems which arise from competition based on the principle of prior treatment for patent applications (according to a certain electric appliance maker).



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SCIENCE AND TECHNOLOGY

## NET CUTTING TIME 80 PERCENT FOR UNMANNED MACHINE TOOL

Tokyo NIKKAN KOGYO SHINBUN in Japanese 25 Oct 78 p 12

[Text] Shin Nippon Koki (2-44 Kyuhoji-cho, Kita-ku, Osaka-shi, president Hisakichi Yamaguchi) has developed a large type unmanned machine tool operating system. The net cutting time for this machine tool is 80 percent, and this success was realized through the development of peripheral equipment that are adapted to the conditions for unmanned operation. This is the first example of unmanned operation in Japan.

This company set up the following conditions for setting out to establish this system: 1) reliability of machines that can operate in stable manner, 2) minimizing indirect time other than pure working time including such items as work setting, tool exchange, and attachment exchange, and 3) suitable measures to counteract machine time off resulting from cutting tool attrition and overloading. The initial work was directed at this company's main line model RB-2 vertical boring and milling machine and its FSP-50H machining center, and a goal of increasing the net operating time from the 45 percent experienced in the past to 80 percent was targeted for the unmanned system that was tested.

The results of this venture resulted in the development of a system that fulfilled the various necessary conditions to realize the original goal, and this success was achieved mainly by the development of suitable peripheral equipment.

Among the peripheral equipment is the automated attachment exchange facility (AAC) that enables five-sided machining on a vertical type machine tool. This unit is provided with an automatic indexing device that operates according to the NC directives. Another peripheral equipment is the automated work exchange facility (AWC) in which large and small type machines placed on palettes can be exchanged and the corresponding control system. This control system is capable of detecting tool attrition that is difficult to predict and overloading as well as detecting tool damage. In addition, it can also detect true cutting time and to sound an alarm when a tool is worn out through the tool exchange indicator.

This system also has a thermal displacement correction facility and a cutting scraps treatment device using high pressure jet along with automated diagnostic capability to prevent down time and erratic work fabrication. This is some of the peripheral equipment that make this unmanned system possible.

This company feels that the development of this machine has resulted in the practical realization of the stage for unmanned operation of large machines. In particular, the doubling of the net working time over what was obtained in the past is expected to contribute greatly to improving production.



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SCIENCE AND TECHNOLOGY

## INTELLIGENT UNMANNED NC LATHE; SELF-DIAGNOSIS, AUTORECOVERY

Tokyo NIKKAN KOGYO SHINBUN in Japanese 27 Oct 78 p 16

[Text] Ikegai Iron Works, Ltd. (president Wasaburo Yamamoto) has perfected a test model of an automated, self diagnostic, intelligent unmanned numerically controlled (NC) lathe (photograph). This unmanned NC lathe normally oversees the operational state of machine fabrication and is capable of reacting to abnormal situations by introducting automated repair of tools or self recovery through an automated and intelligent control device incorporating microcomputers developed by the company. This control facility incorporates a special robot to start and terminate work. As a result, mass production of a product of given shape is possible through completely unmanned operation, and this company plans to enter into production of this facility this coming May.

The NC machine unit is primarily aimed at automated operation. When a lathe is being used in fabrication processes requiring a large number of fabrication operations, there is particularly heavy wear of tools such as cutting tools and drills as well as a high incidence of breakage. At the same time, complexity in shape of products necessitates frequent exchange of tools, thereby slowing down tool exchange, and these incidents have been major hinderances to unmanned operation.

Ikegai Iron Works developed an automated measurement correction facility (FBG) earlier this year that automatically measures product dimensions and detects any deviation from specified values and makes automated correction to the contents of a tool correction register. It then expanded on automated technology to develop the NC lathe incorporating said FRB to complete test production of this intelligent control facility that is a step forward to practical unmanned operation.

Microcomputers are utilized in this intelligent control facility, and eight capabilities are exploited in addition to FBG including capabilities such as fabrication control capability, fixed stress cutting force control capability, machine operation overseeing capability, automated correction and recovery capability, automated retraction termination capability, work

control capability, and data logging capability. These are connected to the special NC facility for unmanned operation provided with special software and to a special robot with tetraaxial control consisting of detection system for main component and thrust cutting forces, automated measurement system in both X and Z directions, and various sensors for observing operational states to make up the unmanned NC lathe.

As a result, whenever a tool has its wear and tear exceed its limit or becomes damaged in any of the processes starting from mounting of the item to be worked on through the cutting process, and up through the release of the finished product, it is immediately exchanged with a fresh tool in automated manner. In addition, precision is maintained, imperfect products or unsuitable materials are automatically rejected, and all types of situations can be automatically counteracted. All the capabilities that can be programmed into this intelligent control facility can be conducted automatically within the given ranges to provide unmanned operation.

In addition, the facility can be used as the usual type of NC lathe whenever several small volume job orders are being fulfilled. For example, the facility can be used in the usual manner during the day and in unmanned operation during the night to employ a "man is first line, machine is second line" production system. There is also the possibility of opening the way for a single man to operate several such facilities. This company is applying for five patents and utility models centered on a patent for a system involving this intelligent control facility. It is using the "FX-20" as base for this test unit, but it is said that the entire line of the FX series can be used.



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SCIENCE AND TECHNOLOGY

## FATTY FOODS REDUCE RISK OF CEREBRAL APOPLEXY

Tokyo MAINICHI DAILY NEWS in English 15 Dec 78 p 12

[Text] Cerebral apoplexy, the No. 1 killer disease responsible for about one quarter of all deaths here in Japan, can be greatly lessened by taking more fat-containing foodstuffs.

This is a conclusion drawn from an extensive survey conducted by researchers of the National Institute of Nutrition, the National Institute for Genetics and other institutions at the request of the Science and Technology Agency.

Their research, conducted over a period of three years, has also clarified, for the first time, the mechanism of cerebral apoplexy.

Some people are more likely than others to suffer from hypertension or cerebral apoplexy, but the incidence of these diseases can be reduced if people with high blood pressure marry people with low or normal blood pressure. Their offspring will be much more resistant to hypertension.

This is because, genetically speaking, hypotension is dominant against hypertension, it was explained.

The joint research has also found that foods containing more fat elements can work in reducing the incidence of cerebral apoplexy, with some proteins, such as those of fish and krill, having similar effects, too. On the other hand, an increase in sugar has been confirmed to increase chances of apoplectic strokes.

Based on these findings, the researchers say that it is possible to control cerebral apoplexy by changing the dietary life of the Japanese people.

No clear relationship has been found between apoplexy and alcohol intake.



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SCIENCE AND TECHNOLOGY

## BRIEFS

SATELLITE LAUNCHINGS--Space engineers will launch Japan's first experimental communication satellite as well as a science research satellite next February. The two separate projects, one of the National Space Development Agency and the other of Tokyo University, were approved by the Space Development Committee of the prime minister's office Wednesday. According to the plan, the agency will launch its initial communication satellite (ECS) from the Kagoshima space center, at Tanegashima Island, on February 5 next year. In the world's first experiment of its kind, the satellite will try to communicate with its ground tracking stations over millimetric waves, the agency said. Meanwhile, the University of Tokyo will launch its satellite "Corsa" using a Mu-3 type rocket from its space center at Uchinoura, also in Kagoshima Prefecture, on February 16. The satellite will probe such mysterious phenomena of the universe as black holes or neutron stars which send X-rays from the space far beyond, a university spokesman said. [Text] [Tokyo MANICHI DAILY NEWS in English 15 Dec 78 p 12]

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END